UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,186	02/20/2004	Robert J. Friday	6561/53798	6186

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EXAMINER
ADDY, ANTHONY S

ART UNIT	PAPER NUMBER
2617	

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>20 February 2004</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-35</u> is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) <u>9-23</u> is/are allowed.

6)☒ Claim(s) <u>1-8 and 24-35</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>20 February 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some *   c)☐ None of:

         1.☐ Certified copies of the priority documents have been received.

         2.☐ Certified copies of the priority documents have been received in Application No. _____.

         3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>05/16/2006</u>, <u>5/29/06</u>.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   The Art Unit location of your application in the USPTO has changed. To aid in

correlating any papers for this application, all further correspondence regarding this

application should be directed to Art Unit 2617.

Information Disclosure Statement

2.   The references listed in the Information Disclosure Statement filed on May 16,

2006 and March 29, 2006 have been considered by the examiner (see attached PTO-

1449 form or PTO/SB/08A and 08B forms). The IDS submitted contain over 100

references. The examiner has considered the references to the extent reasonably

expected during normal examination time. If applicant considers there is a particular

reference or teaching particularly relevant to the claimed invention it is requested from

the applicant to provide a statement indicating such relevance and a clear identification

of such reference.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

4.   **Claim 26** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite

for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention.

With respect to **claim 26**, applicant recites the limitations "the access elements"

on lines 21-23 of claim 26, however there is insufficient antecedent basis for these

limitations in the claim.

Claim Rejections - 35 USC § 102

5.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by
> another filed in the United States before the invention by the applicant for patent or (2) a patent
> granted on an application for patent by another filed in the United States before the invention by the
> applicant for patent, except that an international application filed under the treaty defined in section
> 351(a) shall have the effects for purposes of this subsection of an application filed in the United States
> only if the international application designated the United States and was published under Article 21(2)
> of such treaty in the English language.

6.   Claims 1-8 and 29-34 are rejected under 35 U.S.C. 102(e) as being anticipated

by **Sharony, U.S. Publication Number 2005/0113090 A1 (hereinafter Sharony)**.

Regarding claims 1, 29 and 35, Sharony discloses in a wireless node location

mechanism comprising a plurality of radio transceivers operative to detect the signal

strength of signals transmitted by wireless nodes (see abstract, p. 1 [0008], p. 3 [0024-

0025] and Fig. 1; shows a plurality of wireless access points, AP's 10-30 [i.e. reads on a

plurality of radio transceivers]); wherein at least one of the radio transceivers comprises

a plurality of directional antennas (see p. 3 [0027]), a method comprising detecting, at at

least some of the plurality of radio transceivers, the signal strength of RF signals

transmitted by a wireless node (see p. 3 [0025-0028]); as to the infrastructure radio

transceivers comprising a plurality of directional antennas, detecting the strength of the

RF signals transduced by at least one of the plurality of directional antennas (see p. 3 [0027]); and computing the estimated location of the wireless node using at least some of the signal strengths of the RF signals detected by the infrastructure radios, and knowledge of the antennas used to detect the signal strengths of the RF signals (see p. 3 [0027-0029]).

Regarding claims 2 and 30, Sharony discloses all the limitations of claims 1 and 29. In addition, Sharony discloses a method wherein the computing step comprises identifying the directional antennas associated with the signal strengths to be used in locating the wireless node (see p. 3 [0027]); selecting aspects of an RF physical model associated with the identified directional antennas (see p. 2 [0021-0022 & Calibration Table] and p. 3 [0027-0029]); computing the estimated location of the wireless node using the signal strengths of the RF signals detected by the infrastructure radios, and the selected aspects of the physical model (see p. 2 [0021-0022 & Calibration Table] and p. 3 [0027-0029]).

Regarding claims 3 and 31, Sharony discloses all the limitations of claims 2 and 30. In addition, Sharony discloses a method wherein the aspects of the RF physical model are coverage maps corresponding to respective antennas, wherein at least one of the antennas is a directional antenna (see p. 2 [0022 & Calibration Table] and p. 3 [0027-0029]).

Regarding claims 4 and 32, Sharony discloses all the limitations of claims 3 and 31. In addition, Sharony discloses a method wherein the coverage maps each

comprise a plurality of location coordinates associated with corresponding signal strength values (see p. 2 [0022 & Calibration Table] and p. 3 [0027-0029]).

Regarding claims 5 and 33, Sharony discloses all the limitations of claims 4 and 32. In addition, Sharony discloses a method wherein the coverage maps are heuristically constructed (see p. 2 [0022 & Calibration Table] and p. 3 [0027-0029][i.e. it is inherent the coverage maps are heuristically constructed since Sharony teaches calibration of a physical map overlay of the AP's 10-30 in combination with their respective RSSI data are accomplished by placing a computing device at a number of particular locations within the WLAN 100]).

Regarding claims 6 and 34, Sharony discloses all the limitations of claims 4 and 32. In addition, Sharony discloses a method wherein the coverage maps are based on a mathematical model (see p. 2 [0022 & Calibration Table] and p. 3 [0027-0029][i.e. it is inherent the coverage maps are based on a mathematical model since Sharony teaches calibration of a physical map overlay of the AP's 10-30 in combination with their respective RSSI data are accomplished by placing a computing device at a number of particular locations within the WLAN 100]).

Regarding claim 7, Sharony discloses an apparatus facilitating the location of a wireless node in an RF environment (see abstract and p. 3 [0024-0025]), comprising a plurality of radio transceivers comprising at least one antenna (see abstract, p. 1 [0008], p. 3 [0024-0025 & 0027] and Fig. 1; shows a plurality of wireless access points, AP's 10-30 [i.e. reads on a plurality of radio transceivers]), the plurality of radio transceivers operative to detect the strength of signals transmitted by wireless nodes and provide the

detected signal strengths to a wireless node location model (see p. 3 [0025-0028] [i.e.

wireless access points, AP's 10-30 detect the strength of signals transmitted by rogue

AP 60 and provide the detected signal strengths to a server 70 (i.e. reads on a wireless

node location model)]); wherein at least one of the radio transceivers comprises at least

two directional antennas, and is operative to identify the directional antenna associated

with the detected signal strength for a given signal (see p. 3 [0027]); a wireless node

location model operative to compute the estimated location of a wireless node based on

the antennas identified by at least some of the radio transceivers, and the strength of

signals transmitted by the wireless node as detected by a plurality of radio transceivers

(see p. 3 [0027-0029]).

Regarding claim 8, Sharony discloses all the limitations of claim 7. In addition,

Sharony discloses wherein the wireless node location model comprise a plurality of

coverage maps corresponding to the antennas associated with the plurality of radio

transceivers, the coverage maps including signal strength values for different locations

in a physical region (see p. 2 [0022 & Calibration Table] and p. 3 [0027-0029]).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

8.   Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Sharony, U.S. Publication Number 2005/0113090 A1 (hereinafter Sharony) and

further in view of **Molteni et al., U.S. Publication Number 2004/0066757 A1**

(hereinafter Molteni).

Regarding claim 26, Sharony teaches a wireless network system facilitating the

location of a wireless node (see abstract and Fig. 1), comprising a plurality of radio

transceivers for communication with a wireless node location module (see p. 1 [0008],

p. 3 [0024-0025] and Fig. 1; shows a plurality of wireless access points, AP's 10-30 [i.e.

reads on a plurality of radio transceivers] communicating with server 70 [i.e. reads on a

wireless node location module]); wherein the radio transceivers are each operative to

detect the strength of received signals encoding frames transmitted by wireless nodes

(see p. 3 [0025-0028] [i.e. wireless access points, AP's 10-30 detect the strength of

signals transmitted by rogue AP]); append a signal strength value to frames received

from the wireless nodes (see p. 2 [0015-0018] and p. 3 [0024-0025] [i.e. the limitation

"append a signal strength value to frames received from the wireless nodes" is met by

the teaching of Sharony that the wireless access points, AP's 10-30 continually receive

and compile corresponding RSSI data for rogue AP 60 continually transmitting beacon

signals and the beacon signal contain information including a MAC address to identify

the transmitting AP]); and transmit received frames to a wireless node location module

(see p. 3 [0025-0028] [i.e. wireless access points, AP's 10-30 detect the strength of

received beacon signals transmitted by rogue AP 60 and transmits the RSSI data to a

server 70 (i.e. reads on a wireless node location module)]); wherein at least one of the

radio transceivers comprises a plurality of directional antennas, and is further operative to: select one from the plurality of the directional antennas to receive the frames in received signals (see p. 3 [0027]); a wireless node location module operative to store signal strength data transmitted by the plurality of radio transceivers in association with wireless node identifiers (see p. 1 [0008] and p. 3 [0024-0025]); and compute the estimated location of a wireless node based on the antennas identified by at least one of the access elements, and the signal strength values detected by the access elements (see p. 3 [0027-0029]).

Sharony fails to explicitly teach append an identifier corresponding to the selected antenna to the frames received from the wireless nodes.

In an analogous field of endeavor, Molteni teaches appending a signal strength value received from wireless nodes (see abstract, p. 2 [0029], p. 6 [0105], p. 7 [0110 & 0117] and p. 12 [0186 & 0194] [i.e. the L3 information in the L2 frame received from the AP of the wireless network, a time stamp of when the L2 frame was received from the AP, and an indication of the signal strength of the L2 frame from the AP and note that the L2 frame from the AP (access point) contains an indication of the signal strength value, hence a signal strength value is appended to the frames transmitted by the access point (selected antenna)]).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to modify Sharony with Molteni to append an identifier corresponding to the selected antenna to the frames received from the wireless nodes, in order to identify an antenna of an access point by its unique identifier called the Service Set Identifier

(SSID) for the wireless network of the access point to aid in calculating the location of a

wireless node in a wireless environment with a high precision.

Regarding claim 27, Sharony in view of Molteni teaches all the limitations of

claim 26. Molteni further teaches, wherein the frames are 802.11 frames (see p. 3

[0056]).

Regarding claim 28, Sharony in view of Molteni teaches all the limitations of

claim 27. Sharony further teaches, wherein the wireless node identifiers are MAC

addresses (see p. 2 [0015]).

9.   Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable

over **Palm et al., U.S. Publication Number 2005/0068925 A1 (hereinafter Palm)** and

further in view of **Molteni et al., U.S. Publication Number 2004/0066757 A1**

(hereinafter Molteni).

Regarding claim 24, Palm teaches in a wireless network system comprising a

plurality of radio transceivers, at least some of which comprise a plurality of directional

antennas (see abstract, p. 3 [0038] and Fig. 3), wherein the peak gains of the antennas

are offset relative to each other (see p. 4 [0047-0048] and Figs. 6A & 6B), a method

comprising detecting, at one of the radio transceivers, a signal transduced by one of the

directional antennas, wherein the signal transmits a wireless frame (see p. 5 [0054]), the

wireless frame including a preamble; during receipt of the preamble of the frame,

selecting one from the plurality of the antennas based on at least one attribute of the

respective signals transduced by the antennas (see p. 4[0044] and p. 7 [0071 & 0072]);

switching to the selected antenna for receipt of the remainder of the frame (see p. 4[

0044] and p. 7 [0071 & 0072]).

Palm fails to explicitly teach appending the detected signal strength and an

identifier for the selected antenna to the frame; and transmitting the frame to a wireless

node location module.

In an analogous field of endeavor, Molteni teaches appending a signal strength

value received from wireless nodes (see abstract, p. 2 [0029], p. 6 [0105], p. 7 [0110 &

0117] and p. 12 [0186 & 0194] [i.e. the L3 information in the L2 frame received from the

AP of the wireless network, a time stamp of when the L2 frame was received from the

AP, and an indication of the signal strength of the L2 frame from the AP and note that

the L2 frame from the AP (access point) contains an indication of the signal strength

value, hence a signal strength value is appended to the frames transmitted by the

access point (selected antenna)]).

It would therefore have been obvious to one of ordinary skill in the art at the time

of the invention to modify Palm with Molteni to include a method of appending the

detected signal strength and an identifier for the selected antenna to the frame; and

transmitting the frame to a wireless node location module, in order to identify an

antenna of an access point by its unique identifier called the Service Set Identifier

(SSID) for the wireless network of the access point to aid in calculating the location of a

wireless node in a wireless environment with a high precision.

Regarding claim 25, Palm in view of Molteni teaches all the limitations of claim

24. The combination of Palm and Molteni fails to explicitly teach repeating the

detecting, selecting, switching, appending and transmitting steps for a desired number of radio transceivers; and computing the estimated location of a wireless node based on the antenna identifiers and signal strength values appended to the frames transmitted by the wireless node as detected by the radio transceivers. However, one of ordinary skill in the art further recognizes that it would have been obvious to repeat the steps as taught by Palm and Molteni as addressed in claim 24, in order to calculate the location of a wireless node in a wireless environment with a high precision.

Allowable Subject Matter

10.   Claims 9-23 are allowed.

Conclusion

11.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Goren et al., U.S. Publication Number 2004/0022214 A1 discloses method for locating mobile units based on received signal strength.

Harvey et al., U.S. Publication Number 2004/0198392 A1 discloses method and system for locating a wireless access device in a wireless network.

Haymes et al., U.S. Publication Number 2001/0016489 A1 discloses error correlation for wireless networks.

12.   Any inquiry concerning this communication or earlier communications from the
examiner should be directed to Anthony S. Addy whose telephone number is 571-272-
7795. The examiner can normally be reached on Mon-Thur 8:00am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, Duc M. Nguyen can be reached on 571-272-7503. The fax phone number
for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the
Patent Application Information Retrieval (PAIR) system. Status information for
published applications may be obtained from either Private PAIR or Public PAIR.
Status information for unpublished applications is available through Private PAIR only.
For more information about the PAIR system, see http://pair-direct.uspto.gov. Should
you have questions on access to the Private PAIR system, contact the Electronic
Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a
USPTO Customer Service Representative or access to the automated information
system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anthony S. Addy
June 26, 2006

ELISEO RAMOS-FELICIANO
PRIMARY EXAMINER